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**Robert P Lipton\*** ([lipton@math.lsu.edu](mailto:lipton@math.lsu.edu)), Department of Mathematics, Louisiana State University, Baton rouge, LA 70803. *Dispersion relations for sub-wavelength plasmonic crystals.*

We introduce a new convergent infinite order homogenization theory. This is used to calculate accurate dispersion relations characterizing light propagation inside crystals with inclusions having frequency dependent dielectric properties. We use the theory to identify a new branch of dispersion relations inside plasmonic crystals. This is joint work with Santiago Fortes and Stephen Shipman. (Received January 25, 2010)